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Study to Determine the Role of Platelet Rich Plasma Injection in Treatment of Frozen Shoulder in Terms of Improvement in Pain

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ABSTRACT

Due to the very effective treatment ratio, several researchers have been interested in platelet-rich plasma (PRP) technologies in recent years. This low economic approach of non-operation reduces discomfort, hospitalisation and the danger of limb impairment. This study seeks to investigate the function of platelet-rich plasma injection in frozen pain therapy.

Methodology: This descriptive case series research was done between six months from Jan 2018 to June 2018 in the Department of Orthopedic Mayo Hospital in Lahore, Unit I. A total of 300 patients have been included with the pain relief assessed at 73.3 percent. We include individuals from both sexes aged 40 to 80 years suffering with frozen shoulder problem for 6 weeks.

Results: The average decrease of pain following therapy was 64.57 ± 19.40% with a reduction of 0% and 88.89% respectively. In 267 (87.5%), an improvement of 50% was found, whereas in 38(12.5%) instances, an improvement of less than 50% was noted. There were 172 (64.4 percent) instances with the age groups 40-65 years of age and 95 (35.6%) cases with age 66-80 years of age and 50% of those not shown were 22(57.9% 40-65 years of age and 42.1%) of those with an age group 66-80 years of age.

Conclusion: From the data, we have determined that the PRP approach is far more efficient than any other expensive method in treating frozen shoulders.

KEYWORDS: *Frozen Shoulder, Adhesive Capsulitis, Pain*

I. INTRODUCTION

A total of 2-2.4 percent of the world's population annually suffers from frozen shoulders or adhesive capsulitis with 11.2 occurrences per thousand people cumulative. 1-2. It is a glenohumeral joint disease that limited mobility occurs in the shoulder capsule3-4 because of fibrosis. In general 3-5% of frozen shoulder cases are recorded among the general population, although their morbidity was worrisome in diabetes patients with a 20% prognosis of illness in recent years5. This self-limiting illness has been frequent in 1-3 years but 20-50 percent of patients with the frozen shoulder together with ROM deficiencies have reported disease over a decade in certain studies6. Researchers say this occurs in the 5th and 6th decades of human life and is unusual in the age range of 40 years. Women were highly exposed to a

frozen shoulder compared to men7. The risk of the frozen shoulder for life was 2–4 percent high in diabetic patients together with various co-morbidities like hypoadrenalism, Parkinson's disease, heart disease, pulmonary illness, stroke 8,9. The aetiology of adhesive capsulitis is not yet determined, although the subacromial bursar's inflammatory process was regarded as a cause of disease10.

Frozen shoulder adhesive capsulitis is typically referred to as manual therapy and exercise. But adequate frozen arm treatment is not yet defined. Many operational and non-operational approaches are utilised for handling frozen shoulders. These treatments are mostly aimed at reducing pain and restoring joint function. Conservative therapies such as therapeutic joint injection or anaesthetic manipulation or physical treatment are frequently utilised for the treatment of adhesive capsulitis10-12. Due to the very effective treatment ratio, several researchers have been interested in platelet-rich plasma (PRP) technologies in recent years. This low economic approach of non-operation reduces discomfort, hospitalisation and the danger of limb impairment. After the first treatment of the frozen shoulder, patients achieve a quality life13,14.

A relatively small literature has been published to assess the effectiveness of the PRP technique in adhesive capsulitis patients. This study seeks to investigate the function of platelet-rich plasma injection in frozen pain therapy.

II. Methodology

This descriptive case series study was done in Lahore, Unit I, Department of Orthopedics, Mayo Hospital in the six-month period between January 2018 and June 2018. A total of 300 patients have been included with the pain relief assessed at 73.3 percent. We include individuals from both sexes aged 40 to 80 years suffering with frozen shoulder problem for 6 weeks. Patients with shoulder joint discomfort >3 were included with active and passive motion on a visual analogue scale. Also included were patients with 150 degrees of abduction, 180 degrees of advanced flexion, 45 to 60 degrees of expansion, rotation (elbow flexed to 90 degrees), external and internal rotation of 90 degrees and 70-90 degrees respectively. All moms who were pregnant and lacted were excluded. The investigation did not include patients with a prior history of frozen shoulder, systemic inflammation, and joint osteoarthritis. After receiving an informed consent, patients were enrolled by OPD at the Orthopedic Mayo Hospital Lahore department. Basic demographic information was observed, including patient clinical data. At the initial stage, 20ml of patient blute was taken and centrifuged for five minutes with a double syringe in 5000 rpm to separate the blood into red blood cell layers, a leukocyte buffer and plasma. In addition, plasma has been injected regularly for four weeks into the subacromial region and the intra-articular space. PRP was solely injected into the GH joint at this stage. Two separate devices were utilised for data collecting. Sex was reported in the first section of the questions relating to patients' age. The second portion was based on a visual analogue scale with pain occurrences at 0-10 grades. These classifications contain no pain (0), mild (1-3), moderate pain (4-7) and severe pain (8-10). In prior research, this visual analogue scale has been accurate and reliable. This research was conducted with the institution's ethical approval. All the principles stated in the Helsinki Protocol have been observed. The patients were completely informed of the aims, and prior to any intervention formal consents were collected from them. Before and during the 6th week of therapy pain was monitored. After each injection, a little activity was suggested for patients.

We utilised the SPSS 22.0 version for data analysis for this research. Mean and Standard deviation was used to evaluate quantitative data at 6 weeks, e.g. age and paine, whereas frequency distribution was utilised to assess qualitative data such as gender and pain score improvement. The comparison was made using the Chi-square formula. We have selected 0,05 for this research as a statistically significant threshold.

III. Results

The mean age for patients was 60,47 ± 11,55 years while the age of 40 and 80 was minimum and highest. 164 (53.8%) were male and 141 (46.2%) were female patients with greater male-to-female ratios. The median pre- and post-treatment pain was 6.56 ± 1.79 and 2.42 ± 1.71. The average decrease of pain following therapy was 64.57 ± 19.40% with a reduction of 0% and 88.89% respectively. In 267 (87.5%), an improvement of 50% was found, whereas in 38(12.5%) instances, an improvement of less than 50% was noted. There were 172 (64.4 percent) instances with the age groups 40-65 years of age and 95 (35.6%) cases with age 66-80 years of age and 50% of those not shown were 22(57.9% 40-65 years of age and 42.1%) of those with an age group 66-80 years of

age. The frequency of 50 percent better in both age groups was statistically same, p-value > 0.05. In the case of TEM 50% of the cases, there have been 144 (53.9%) male and 123 (46.1%) female instances, and among those that have not shown TEM 50% 20 (53.6%) male and 18 (47.4%) female cases.

The incidence of a 50 percent improvement for both genders, p•value> 0.05, was statistically same. In case of 50% improvement there have been 144 (53.9%) disease duration cases <12 week and 123 (46.1%) disease cases from 12 weeks and 26(68.4%) disease cases from cases that did not demonstrate <12 weeks and 12(31.6%) disease cases <12 weeks and 12(31.6%) cases from 12 weeks. The rate of improvement of 50 percent was statistically same irrespective of the length of illness, p•value>0.05. There were 94 (35.2%) baseline pain cases with baseline pains < 6 and 173 (64.8%) with initial pain as low as 610, while 10 (26.3%) cases with baseline pains < 6 and 28 (73.7%) with baseline pain were found in cases without baseline pain as 6% improvement with < 5%. The frequency > 50 percent is the same, independent of the baseline pain, p value > 0.05.

Table 1: Descriptive statistics of Age (years), pain and reduction

Variables	Mean ± SD	Total Range	Minimum	Maximum
Age	60.47 ± 11.55	40	40	80
Score before pain	6.56 ± 1.79	5.00	4.00	9.00
Score after pain	2.42 ± 1.71	6.00	1.00	7.00
Reduction	64.57 ± 19.40	88.89	0.00	88.89

Table 2: Comparison of Improvement ≥ 50% with respect to age, gender, disease duration, and baseline pain

Variables	Improvement ≥ 50%		Chi square	p value
	Yes	No		
Age			0.612	0.434 (Insignificant)
40- 65	172 (64.4%)	22 (57.9%)		
66- 80	95 (35.6%)	16 (42.1%)		
Gender			0.023	0.880 (Insignificant)
Male (n= 164)	144 (53.9%)	20 (52.6%)		
Female (n= 141)	123 (46.1%)	18 (47.4%)		
Duration of disease			2.830	0.092 (Insignificant)
<12 weeks	144 (53.9%)	26 (68.4%)		
≥ 12 weeks	123 (46.1%)	12 (31.6%)		
Pain			1.170	0.279 (Insignificant)
Before < 6 weeks	94 (35.2%)	10 (26.3%)		
After 6-10 weeks	173 (64.8%)	28 (73.7%)		

IV. Discussion

In the past, manual treatment and exercises combined with physical therapy measures have removed frozen shoulders. In our study we discovered that women with a peak age of 56 years were more likely to have adhesive capsulitis. In 6–17 percent of individuals in this study, a frozen shoulder was again impacted following treatment with their initial shoulder within five years. The majority of patients with non-dominant shoulders15 were impacted.

The frozen shoulders are usually classified as main or secondary. Primary frozen shoulder radiographs appear to be normal and idiopathic while the subsequent frozen shoulder appears owing to systemic, intrinsic or extrinsic disease15. The whole length of the frozen shawl is between 3 stages, i.e. freezing, frozen and thawing stages, also known as painful inflammatory stage, that are 12 to 18 months 16. Usually, the average time period of the frozen shoulder is 6 months, although this may vary depending on the conditions of the patient. In the inflammatory stage of frozen patients with continuous discomfort with limited movement of the capsular pattern. In the second phase of shoulder rigidity individuals saw less discomfort but limited their movement or function. In the last stage, however, motions of the shoulder were recovered with less discomfort17. Typically the goal of adhesive capsulitis was to alleviate discomfort, restore function and keep moving. There are numerous modes of physiotherapy include exercises, electrotherapy or massage. Literature says that deep heat massage, cold, ultrasound, TENS, (transcutaneous electrical stimulation of the nerve) and LASER methods can decrease pain, but the advantages are low in practice18. Ultrasonic treatment has often been utilised as an intervention owing to the

physiological effects of the procedure, including an increase in blood flow, high capillary permeability and tissue metabolism. In the past, due to its high morbidity ratio, frozen shoulder therapy was advanced15. Patients are currently treated in several countries using Intra-Aortic Corticosteroid Injection due to great availability and cost-effectiveness16. Following the good results of soft tissue revascularization PRP technique is gaining attention and increases the concentration of growth factors to improve and speed tendon repair. The latest case study revealed 60% recovery in the frozen shoulder following the initial PRP17 injection. Based on these data, at the 6th week of the illness we undertook a pilot study of 15 patients. In 11 (73.3 percent) cases favourable results in terms of pain reduction were found at 50 percent. We persuade our investigation with 300 patients with an average age of 60.47 ± 11.55 after these successful results. The maximum patient age in this group was 80 years and the minimum age was 40 years. Total 267 patients (87.5%) reported improvement in decrease in pain <50%, while 38 (12.5%) reported improvement <50%.

A new study has described the effectiveness of PRP therapy in painful shoulder condition. They provide PRP injection with a quick dash questionnaire at 7-day intervals in order to obtain the results. Their investigation was carried out over a period of one year. Prior to PRP administration, the Quick Dash pain score was reported to be 42 (35-52) following the treatment score was lowered from one to three months to 18 (13-26) to 13 (11-23). They found that therapy with PRP also helps to minimise patients' subjective problems and leads to a complete recovery4. These results are consistent with our results. Another study revealed satisfactory results of PRP therapy in 12 weeks without any harmful impact on the patient19. They determined that PRP is considerably superior than corticosteroid treatment and ultrasound. After 12 weeks of PRP therapy, we evaluated active and passive range of motion.

V. Conclusion

From the data, we have determined that the PRP approach is far more efficient than any other expensive method in treating frozen shoulders. Easy PRP injections and cheap cost injections lessen the hospital load with little risk of limb impairment.

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